

**CLAIMS**

What is claimed is:

1. An apparatus for forming a duct member from a work piece for use in an air handling system comprising:
  - a housing including a work station formed therein adapted to accommodate the work piece;
  - a means for clamping the bottom of the work piece to prevent rotation of the bottom of the work piece;
  - a die associated with the work station which is selectively positioned at a predetermined location relative to the work piece positioned in the work station;
  - a rotating head associated with the work station comprising a cutting and forming assembly, and a means for selectively coupling a portion of the work piece to the rotating head; wherein the cutting and forming assembly cooperates with the die to selectively cut the work piece to form first and second work piece members; wherein the means for selectively coupling a portion of the work piece to the rotating head engages the first work piece member and rotates the member 180 degrees with respect to the second work piece member;
  - wherein the cutting and forming assembly cooperates with the die to form a coupling bead in the first and second work piece members which cooperate to reconnect the first and second work piece members together at a predetermined angle;
  - a means to rotate the reconnected work piece 180 degrees for subsequent cuts;
  - a means to axially move the reconnected work piece with respect to the die to move the work piece to a predetermined location for a subsequent cut.
2. The apparatus of claim 1, wherein the means for selectively coupling a portion of the work piece to the rotating head and for rotating the first work piece member 180 degrees with

respect to the second work piece member comprises a plurality of fingers radially extendable from the head assembly to grip the interior of the first work piece member.

3. The apparatus of claim 2, wherein the plurality of fingers are hydraulically engaged.
4. The apparatus of claim 2, wherein each of the plurality of fingers are biased in a radially inward direction by a spring.
5. The apparatus of claim 1, wherein the cutting and forming assembly comprises a cutting wheel radially extendable from the head assembly.
6. The apparatus of claim 1, wherein the cutting and forming assembly comprises a beading wheel radially extendable from the head assembly.
7. A rotating head assembly for an automatic adjustable duct machine comprising:
  - a rotating head body;
  - a slide block having a cutting wheel and a beading wheel thereon, wherein the slide block is moveable within the head body to selectively extend one of the cutting wheel and the beading wheel radially outward from the rotating head body;
  - a plurality of engagement members extendable radially outward of the rotating body in an engagement position and retractable radially inward to a disengagement position.
8. The head assembly of claim 7, wherein the means for rotating the first work piece member 180 degrees with respect to the second work piece member comprises a plurality of fingers radially extendable from the head assembly to grip the interior of the first work piece member.
9. The head assembly of claim 8, wherein the plurality of fingers are hydraulically engaged.

10. The head assembly of claim 8, wherein each of the plurality of fingers are biased in a radially inward direction by a spring.

11. The head assembly of claim 7, wherein the means for cutting a work piece in association with a die of an automatic adjustable duct machine into a first work piece member and a second work piece member comprises a cutting wheel radially extendable from the head assembly.

12. The head assembly of claim 7, wherein the means for adjustably connecting the first work piece member to the second work piece member in association with a die of an automatic adjustable duct machine comprises a beading wheel radially extendable from the head assembly.

13. A method for forming a duct member for use in an air handling system comprising the steps of:

- a) providing a tubular work piece;
- b) inserting the tubular work piece into an automatic adjustable duct machine
- c) clamping the bottom of the work piece
- d) cutting and preforming the tubular work piece into a first work piece portion and a second work piece along a plane at an angle to a radial plane perpendicular to the longitudinal axis of the work piece;
- e) rotating the first work piece portion 180 degrees relative to the second work piece portion;
- f) adjustably connecting the first work piece member to the second work piece member;
- g) rotating the reconnected work piece 180 degrees;
- h) moving the work piece longitudinally to a second position;
- i) repeating steps d-f;
- j) releasing the clamped bottom of the work piece such that the work piece can be removed from the automatic adjustable duct machine.

14. The method of claim 13, wherein the angle is 22.5 degrees.
15. The method of claim 14 further comprising the step of repeating steps d-h prior to step i.
16. The method of claim 13, wherein the angle is 15 degrees.
17. The method of claim 14, wherein the released work piece is formed as a 90 degree adjustable duct member.
18. The method of claim 14, wherein the released work piece is formed as a 90 degree adjustable elbow.